

Mirage.—Indianola, 1st, 10th, 18th, 19th, 21st, 31st. Huron, Dak., 11th, a. m., on the eastern horizon, making the town of Iroquois, 22 miles distant, visible through the telescope; houses, barns, haystacks, etc., were distinctly seen. The phenomenon lasted 55 minutes. 31st, 7.30 to 8.30 a. m., mirage making objects 30 miles distant, visible to the naked eye; with the aid of a telescope, small trees could be distinguished in the gulches of the Wessington Hills, 30 miles distant. Council Grove, Kan., 11th, 17th 31st. Northport, Mich., 29th.

MISCELLANEOUS PHENOMENA.

Sunsets.—The characteristics of the sky as indicative of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Service stations. Reports from 187 stations show 5,756 observations to have been made, of which 34 were reported doubtful; of the remainder, 5,722, or 83.3 per cent., were followed by the expected weather.

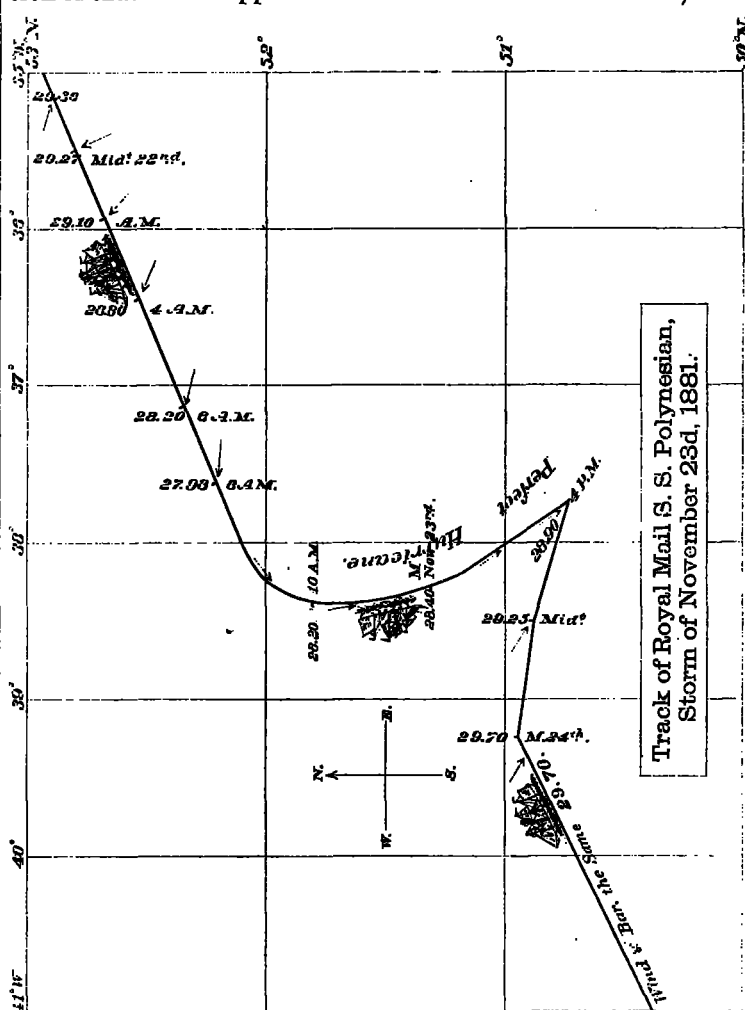
Sun Spots.—The following record of observations has been forwarded by Mr. D. P. Todd, Director of the Lawrence Observatory, Amherst, Mass.:

DATE— Jan., 1882.	No. of new		Disappeared by solar rotation.		Reappeared by solar rotation.		Total No. visible.		REMARKS.
	Grps.	Spots	Grps.	Spots	Grps.	Spots	Grps.	Spots	
2, 2 p. m.	0	0	0	0	0	0	2	15	
3, 10 a. m.	0	0	0	0	0	0	2	15	
5, 11 a. m.	1	5	0	0	0	0	3	20†	
7, 12 m.	0	0	1	5	0	0	2	15	
9, 3 p. m.	1	5	0	5	1	5	3	15	
10, 11 a. m.	1	2	0	5	1	2	4	12	
12, 9 a. m.	1	3	1	4	1	4	4	16	
14, 9 a. m.	0	6	0	2	0	6	4	20	
15, 10 a. m.	0	4	0	0	0	0	3	20	
17, 1 p. m.	1	2	1	8	0	0	3	12	
18, 10 a. m.	1	6	0	0	1	2	4	18	
19, 12 m.	1	2	0	0	0	0	5	20	
22, 12 m.	1	9	0	0	0	0	4	12	
23, 1 p. m.	1	2	0	2	1	2	4	12	
24, 12 m.	1	1	1	2	1	1	4	11	
27, 10 a. m.	1	8	0	0	0	0	4	20†	
29, 12 m.	0	5	0	0	0	0	4	25†	
30, 2 p. m.	0	0	0	5	0	0	4	20†	

†Approximated. Faculae were seen at the time of every observation.

Mr. William Dawson, at Spiceland, Ind., reports: 9th, 3 groups, 6 spots, 2 spots at east edge, 2 at west, and 2 north of centre; air very poor; power 36. 14th, 4 groups, 23 spots; air poor; power 50. 17th, 3 groups, 5 spots; air poor; power 50. 27th, 4 groups, 30 spots, one large spot near east and another near west edge; air tolerably good; power 100. 30th, 5 groups, 57 spots; air good; power 100. Mr. H. D. Govey, at North Lewisburg, O., reports: sun spots were observed on 2nd, 9th, 14th, 17th, 22nd, 23rd, 24th, 27th, 30th, or on every clear day during the month; they were least numerous on the 9th, and largest on the 30th. The following record of observations has been forwarded by Mr. A. G. Bender, Sacramento, Cal.: 6th, 12 m., 1 group, 10 spots. 7th, 12 m., 1 group, 7 spots. 8th, 12 m., 1 group, 6 spots. 9th, 12 m., 1 group, 2 spots; 1 group and 6 spots disappeared by solar rotation. 10th, 12 m., 1 group, 2 spots; filmy clouds probably prevented the observation of some of the smaller spots. 11th, 12 m., 3 groups and 8 spots; 2 groups and 5 spots, new. 12th, 12 m., 3 groups, 8 spots. 13th, 12 m., 3 groups, 6 spots. 14th, 12 m., 2 groups, 10 spots, 1 group disappeared. 15th, 12 m., 2 groups, 8 spots; 2 spots disappeared. 17th, 12 m., 2 groups, 4 spots; 2 groups, each with one large and 10 small spots. 18th, 12 m., 2 groups, 4 spots. 19th, 12 m., 1 new group, and 2 spots; 1 group and 2 spots disappeared by solar rotation; both spots in new group, large and near together. 20th, 12 m., 2 groups and 2 spots. 21st, 12 m., 3 groups and 8 spots; 1 group and 3 spots new. 24th, 12 m., 3 groups and 4 spots; 1 group and 2 spots new, and the same number of each disappeared by solar rotation. 25th, 12 m., 5 groups and 10 spots; 2 groups and 2 spots new. 27th, 11 a. m., 21 groups and 4 spots; 10 groups new and 2 groups disappeared by solar rotation. 28th, 11 a. m., 6 groups and 17 spots; 2 groups and 13 spots new. 29th, 11 a. m., 6 groups and 16 spots. 30th, 12 m., 7 groups and 21 spots.

Errata.—The chart below has been republished as a correction of that which appeared in the REVIEW for November, 1881.



The following is a copy of the letter of Commander R. Brown, addressed to the Chief Signal Officer and accompanying the above chart:

"Having experienced very heavy weather during my last passage from Liverpool to Boston, and particularly on the 23d ult., when we encountered quite a hurricane, I herewith enclose you a diagram, with the ship's position, direction of the wind, (as per arrows,) and the heights of the barometer, with a few remarks on the same. Tuesday, 22d of November, noon, strong gales from northwestward, which had been blowing much the same for the previous 24 hours, barometer ranging between 28.90 and 29.36. Towards midnight the wind fell calm. Then a light air sprung up from the south, veering towards the south-eastward; weather very dark, much lightning all round, more so towards the southeastward; no thunder; several *composants*, i. e., St. Elmo lights on the yards and stays, glass falling rapidly and sea very high and turbulent. 8 a. m., strong gale from SE., with snow and hail squalls. 10 a. m., blowing a hurricane from E.; squalls terrific, with terribly high and confused sea. Kept ship running before, it would have been highly dangerous to attempt to round too. Noon, 23d, glass rising rapidly; blowing as hard as ever; sea a complete mass of spindrift, high and awfully confused; squalls succeeding each other rapidly and roaring with their violence. 3 p. m., weather breaking. 4. p. m., wind NNW., rounded too, ends strong, gale from north-westward, with a high confused sea; obliged to keep ships stem on and steam easy. This weather continued much the same till the evening of the 24th, wind from the same quarter NW., when it moderated and went round to the southward for about 12 hours; it then got back to the northwestward,

where it continued for the remainder of the passage, occasionally getting to WSW. and back again."

The following statement shows the summarized precipitation for the 12 months ending June 30th, 1881, at the various stations of the Central Pacific Railroad, furnished through the courtesy of its chief engineer, Mr. S. S. Montague: San Francisco, 29.89 inches; Oakland, 20.79; Niles, 20; Pleasanton, 19.57; Livermore, 16.45; Tracy, 10.68; Lathrop, 13.34; Stockton, 15.31; Galt, 15.93; Brighton, 13.63; Sacramento, 22.14; Rocklin, 21.32; Auburn, 37.42; Colfax, 48.14; Alta, 50.97; Emigrant Gap, 62.26; Cisco, 82.71; Summit, 66.39; Truckee, 21.97; Boca, 15.80; Reno, 5.74; Wadsworth, 4.23; Hot Springs, 2.95; Brown's, 3.38; Humboldt, 5.52; Winnemucca, 10.18; Golconda, 4.92; Battle Mountain, 6.07; Beowawe, 6.26; Palisade, 10.61; Carlin, 10.35; Elko, 5.35; Halleck, 4.64; Wells, 3.97; Otego, 5.35; Toano, 2.34; Tecoma, 2.62; Terrace, 4.24; Kelton, 5.03; Promontory, 2.93; Blue Creek, 12.01; Corinne, 14.57; Ogden, 11.55; Marysville, 17.43; Chico, 17.62; Tehama, 10.40; Red Bluff, 28.95; Redding, 50.77; Modesto, 8.40; Turlock, 9.05; Merced, 11.59; Borden, 10.68; Fresno, 8.22; Kingsburg, 9.49; Martinez, 19.66; Dunnigan, 19.65; Williams, 15; Willows, 13.67; Antioch, 17.39; Brentwood, 12.49; Byron, 16.05; South Vallejo, 21.98; Napa, 28.19; Calistoga, 40.48; Suisun, 24.52; Davis, 18.55; Woodland, 18.54; Knight's Landing, 17.96; San Mateo, 21.09; Menlo Park, 18.36; San Jose, 12.46; Tenant's, 24.81; Gilroy, 23.42; Hollister, 12.48; Pajaro, 19.91; Salinas, 12.48; Soledad, 6.78; Monterey, 13.91; Santa Cruz, 29.64; Lemoore, 8.59; Visalia, 10.65; Goshen, 9.69; Tulare, 9.98; Delano, 6.75; Sumner, 3.59; Caliente, 9.80; Keene, 11.12; Tehachapi, 8.16; Mohave, 1.27; Ravena, 5.40; Newhall, 9.15; San Fernando, 9.45; Los Angeles, 10; Spadra, 10.22; Colton, 6.08; Whitewater, 4.69; Indio, 1.20; Mammoth Tank, 1.82;

Yuma, 1.29; Texas Hill, 1.52; Maricopa, 0.88; Pantano, 1.25; Ione, 17.26; Farmington, 13.20; Anaheim, 7.08; Petaluma, 23.29.

Meteors.—Des Moines, Ia., 18th; Davenport, Ia., 22d; Helena, Mont., 15th; North Platte, Neb., 16th, 6.20 p. m., meteor of unusual size shot from a point near the zenith towards the western horizon, and bursted at an altitude of about 30°, casting a beautiful cluster of incandescent points of light in every direction. Yuma, Ariz., 5th, 9th, 17th; Rio Vista, Cal., 20th; Monticello, Ia., 17th, 22d; Dexter, Me., 7th; Woodstock, Md., 11th, 14th, 24th; Clear Creek, Neb., 8th, 10th, 11th, 13th, 14th, 16th to 19th, 21st; Atco, N. J., 9th, 14th, 22d; Stateburg, S. C., 14th; Flemington, W. Va., 30th.

Migration of Birds.—*Geese flying northward:* Augusta, 14th; Shreveport, 12th; De Soto, Nebr., 5th. *Flying southward:* Laconia, Ind., 21st; Cairo, Ill., 28th, 29th; Portland, Or., 20th; Sacramento, Cal., 5th, 6th, 8th. *Indanola, 6th, 10th. Ducks flying northward:* Charleston, Ill., 2d, 26th; Shreveport, 30th, Yates Centre, Kan., 9th. *Flying southward:* Port Huron, 5th.

Polar Bands.—Baltimore, Md., 27th; Pensacola, Fla., 27th; Nashville, 2d; Florence, Ariz., 23d, 26th; Prescott, Ariz., 13th; New Corydon, Ind., 3d, 9th, 17th, 18th, 24th, 27th, 30th; Auburn, N. H., 30th; Freehold, N. J., 9th, 29th; Vineland, N. J., 13th, 15th; Waterburg, N. Y., 19th; Woodstock, Vt., 25th; Wytheville, Va., 3d, 11th, 22d, 23d, 24th.

Earthquakes.—Cape Lookout, N. C., 8th, 5.10 p. m., shock of about 10 seconds duration; house forcibly shaken, jarring windows and doors. Centerville, Cal., 26th, two severe shocks.

Prairie and Forest Fires.—Yankton, Dak., 6th to 9th, 23d, 24th; Ft. Gibson, Ind. Ty., 5th, 7th, 24th.

Sand Storms.—Ft. Verde, 11th; Yuma, 7th, 11th.

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